

ABSTRACT OF THE DISCLOSURE

To achieve both a fast risetime and a desired flat top current pulse, or to be able to independently specify a risetime and pulse width (energy), a supplemental or "fast" voltage discharge stage (or multiple supplemental or "fast" voltage discharge stages) having a faster and shorter voltage discharge characteristic and a higher starting voltage relative to the main or "slow" voltage discharge stage is used in parallel with the slow voltage discharge stage. The energy storage element of the slow voltage discharge stage has sufficient energy storage at an appropriate voltage level for maintaining the desired flat top current throughout the pulse duration, while the energy storage element of the fast voltage discharge stage has less energy storage capability but a higher starting voltage for achieving the desired fast current pulse risetime. Preferably, a single closing switch is used to couple all energy storage elements to the laser diode to pulse it, although respective separate switches may be used to couple the energy storage elements of the various voltage discharge stages to the laser diode.